

The listing of claims set forth below will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. **(Currently Amended)** A method for using transcranial magnetic stimulation to change the performance of a subject to enhance cognitive performance, comprising the steps of:

- (a) locating at least one neural circuit in the brain of ~~[[a]]~~ the subject, which is activated when the ~~person~~ subject performs a predetermined task;
- (b) positioning an electromagnetic coil over a region on the scalp of the subject corresponding to the at least one neural circuit ~~in the brain of the subject; and~~
- (c) delivering a transcranial magnetic stimulation from the coil to the ~~region on the scalp of the person to induce current to flow in the brain at least one neural circuit that causes, thereby causing~~ neuronal depolarization in the at least one neural circuit ~~brain;~~ and
- (d) ~~effectuates~~ effectuating a change in the performance of the predetermined task by the subject.

2. **(Original)** The method of claim 1, wherein the subject is a human being.

3. **(Currently Amended)** A method for using transcranial magnetic stimulation to change the performance of to enhance cognitive performance in a plurality of subjects, comprising the steps of:

- (a) dividing the plurality of subjects into groups,
- (b) subjecting each of the groups into a first state and a second state,
- (c) locating at least one neural circuit in the brain of a subject in the group corresponding to one of the first state and the second state, wherein the at least one neural circuit ~~which~~ is activated when the subject performs a predetermined task under one of the first state and the second state,
- (d) positioning an electromagnetic coil over a region on the scalp of the subject corresponding to the at least one neural circuit ~~in the brain of the subject, and~~

- (e) ~~delivering a transcranial magnetic stimulation from the coil to the region on the scalp at least one neural circuit of the subject to induce a current to flow in the brain that causes, thereby causing~~ neuronal depolarization in the brain at least one neural circuit, and
- (f) ~~effectuates~~ effectuating a change in the performance of the predetermined task by the subject under one of the first state and the second state.

4. **(Original)** The method of claim 3, wherein the subjects are human beings.

5. **(Original)** The method of claim 3, wherein the first state is a state in which a subject is at rest, and the second state is a state in which a subject is sleep-deprived.

6. **(Original)** The method of claim 3, wherein functional magnetic resonance imaging maps are used to identify different neural circuits associated with different subject on a state, wherein the neural circuits are activated while a predetermined task is performed.

7. **(Currently Amended)** The method of claim 6, wherein transcranial magnetic stimulation ~~is delivered to proper neural circuits to~~ restores and/or retrains the circuits to enhance the performance.

8. **(Currently Amended)** A method of using transcranial magnetic stimulation ~~to enhance cognitive performance in~~ to affect the behavior of at least one subject, comprising:

- (a) during a behavior individualized imaging of at least one cognitive neural circuit,
- (b) locating the at least one cognitive neural circuit,
- (c) individually positioning an electromagnetic coil over a region on the scalp of the subject corresponding to the at least one cognitive neural circuit, ~~and~~
- (d) delivering a transcranial magnetic stimulation through the electromagnetic coil to the at least one cognitive neural circuit, and
- (e) [[to]] affecting the behavior related to the at least one cognitive neural circuit.

9. **(Original)** The method of claim 8, wherein individualized imaging can be performed by a functional magnetic resonance imaging scanner.

10. **(Original)** The method of claim 8, wherein the electromagnetic coil is interleaved with a transcranial magnetic stimulation system to provide synergistic stimulation(s).

11. – 14. **(Canceled)**

15. **(Currently Amended)** A portable system for using transcranial magnetic stimulation to change the performance of~~enhance cognitive performance in~~ at least one subject, the system comprising:

a CPU;

an energy source electrically coupled to the CPU;

a database in communication with the CPU and having functional magnetic resonance imaging (fMRI) maps of neural circuits corresponding to a plurality of tasks stored therein; and

a movable electromagnetic coil electrically coupled to the energy source and in communication with the CPU,

wherein when a subject is to perform a predetermined task, the CPU selects one or more fMRI maps of one or more neural circuits from the corresponding to the predetermined task from the database and causes the movable electromagnetic coil to be positioned over a region on the scalp of the subject according to the selected one or more fMRI maps, and

wherein the movable electromagnetic coil delivers transcranial magnetic stimulation to the region on the scalp ~~of the subject so as to induce a current to flow in the brain, cause neuronal depolarization in the brain,~~ and effectuates a change in the performance of the predetermined task by the subject.

16. **(Original)** The system of claim 15, wherein the energy source is a battery.
17. **(Original)** The system of claim 15, wherein the database is associated with a memory device of the CPU and/or a separate memory device.
18. **(Currently Amended)** The system of claim 15, wherein the subject is a ~~person~~ human being.
19. **(Original)** The system of claim 15, wherein the subject is an animal.
20. **(Original)** The system of claim 15, wherein the system is constructed within a frame that is portable.
21. **(Original)** The system of claim 15, wherein the system comprises an array of transcranial magnetic stimulation coils, each being able to deliver transcranial magnetic stimulation individually or in coordination.
22. **(New)** The method of Claim 1, wherein the change is an improvement.
23. **(New)** The system of Claim 15, wherein the change is an improvement.